NetBackup Vault Extension

Functional Overview & Integration Guide

A long-term yet simple solution for protecting business today simply cannot tolerate down-time and service interruptions in accessing data when the very viability of the business depends upon it. Guaranteed continuous access to conventional files, multi-media data, and relational databases has become a critical business requirement.

Veritas now delivers the NetBackup Vault Extension to simplify media storage in offsite locations. This enhancement to Veritas' NetBackup delivers batch processing for tape duplication, offsite tape vaulting for tape originals or duplicates, and essential reports for normal operations.

Veritas' NetBackup Vault Extension is available today on Sun Solaris platforms, DEC OSF/1, HP's HP-UX, IBM AIX, SGI IRIX, Sequent DYNIX and Windows NT.

This document describes the architectural, functional, and implementation aspects of the NetBackup Vault Extension. It assumes familiarity with the Veritas' integral components - NetBackup.

The Components

The NetBackup Vault Extension consists of NetBackup running on top of a storage server configuration, and a set of Vault utilities.

NetBackup NetBackup provides backup, archive, and restore capabilities for files, directories, databases, and raw partitions contained on client systems in a client-server network. NetBackup *server* software resides on platforms that manage physical storage devices and is the repository for all client backup images. NetBackup *agent* software resides on individual client systems containing the data to be backed up.

Bpvault Bpvault is a set of Vaulting utilities, which reside on the NetBackup Master server. These utilities use existing NetBackup functions for all operations, such as tape duplication and media control. They provide batch processing of tape duplication, tracking of media used by duplication, assignment of media to offsite "slots", essential reports and automatic ejection and injection of tapes used for vaulting. Configuration files support different combinations of master and slave and vaulting of specified classes. Networked duplication is supported, as is the ability to vault original media after a specified time period and for a specific time period.

NetBackup Vault Extension is available as an enhancement for any specific NetBackup Master on Solaris, AIX, Ultrix, HP-UX, IRIX, DYNIX and Windows NT. Additional Masters require

additional copies of Vault Extension. NetBackup Vault Extension supports Storage Tek's ACSLS, Media Manager's TLD, TL8, TLH and TLM architecture for robotic control - other robotics support requires confirmation.

The Architecture

A NetBackup Vault Extension configuration consists of the NetBackup Master server and optional slave servers. Only the NetBackup master runs the vaulting utilities (except for tape import). The Vault software will centrally run duplication that can occur on all backup servers in different configurations.

Hardware Configuration

The basic configuration for a NetBackup Vault Extension requires:

- One NetBackup UNIX or NT Master server
- Optional Veritas NetBackup slave servers
- ACSLS, TLD, TL8, TLH or TLM controlled robotic devices (call for other robotic support)
- Tape drives required for tape duplication
- Printer for vaulting reports

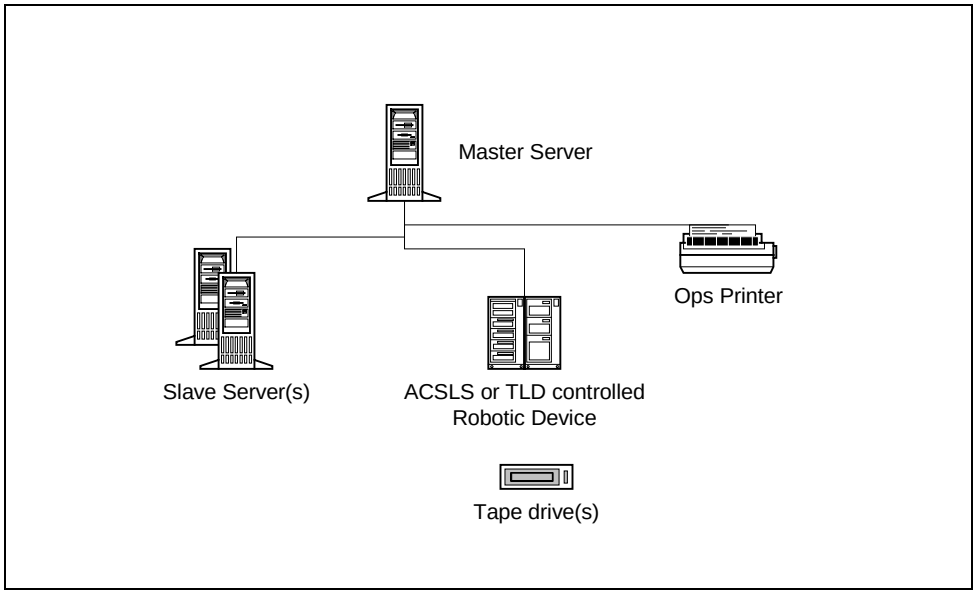

Figure 1
Typical NetBackup Hardware Configuration

Software Architecture

The software configuration for NetBackup Vault Extension requires the following software, which is licensed separately from the Vault Extension:

- Veritas NetBackup Master server software
- Optional Veritas NetBackup slave server software
- Veritas NetBackup Vault Extension software on the Master server
- Optional robot inject scripts on each slave server for import function

Functional Description

Net Backup Vault Extension provides both backup duplication and offsite storage and retrieval of media. The system duplicates backup images onto tape or other media and simplifies restoring the duplicated files when the original backup image media is damaged or unavailable. NetBackup Vault Extension takes advantage of the NetBackup master-slave implementation that extends storage to other machines by centrally controlling duplication for multiple backup servers simultaneously. The system also ejects the duplicated media from any robotic storage units, assigns offsite vault slot numbers and requests these tapes to be returned from the offsite location after a specified period of time, e.g. when the backup is no longer needed.

Services

Basic services include:

- Provides additional backup protection by duplicating backup images.
- Support of multiple media types for both backup and duplication media to provide for optimal cost-effective configurations.
- Provides batch duplication to maximize resource utilization.
- Maintains file operating system level information and security.
- Utilizes NetBackup three-tier architecture to create a scaleable, distributed and heterogeneous design.
- Controls tape storage within tape silo versus tapes ejected from silo for transport to offsite vault.
- Automatic assignment of vault slot identifiers when required for use by vault vendor.
- Generation of various reports including media usage, pick lists and vault inventory.

- Usage of existing NetBackup capabilities for key features to ensure compatibility and robustness:

  Maintains duplication image catalog for recovery services.

  Uses existing Media Manager services for fundamental media and robotic management and control.

  Uses existing Media Manager database for tracking of media containing duplicated images.

  Uses NetBackup backup image catalog to keep track of which images need to be duplicated and which images are already duplicated.

  Uses NetBackup media catalog to determine expiration date of used media.

Requirements

One of the first steps in a disaster recovery plan for distributed systems is to establish a vault management system with an offsite storage location to consist of critical data. This data is normally stored on magnetic media, which may be a duplicate of media that is located at the data center. Other requirements of a vault management strategy are:

- Need to move duplicate or original media to offsite location.
- Mainframe customers have established vaults and offsite service providers.
- Establish schedule of when to send media offsite.
- Determine when to retrieve offsite media for re-use.
- Tracking of media while stored at offsite location.
- Daily reporting of media shipments and, if applicable, duplication process.
- Efficient use of resources, if implementing a duplication process.

Solution

NetBackup Vault Extension integrates all of these components to provide a vault management system that can be used to assist in disaster recovery planning. NetBackup Vault Extension provides:

- Key utility **'bpvault'** which provides core functionality.
- Usage of standard NetBackup commands.
- Storage of most information within the NetBackup and Media Manager catalogs.
- Parameter file used to specify configuration rules such as:
  - Number of servers to use for duplication
  - Tape drive pairs to use for duplication
  - NetBackup classes to be duplicated
  - Media Manager volume pool to use for destination
- Vault original media after specified number of days.
- Backup the NetBackup and Media Manager catalog database and vault used media.
- Support of media eject and inject for Media Manager robotics.
- Provides option to duplicate locally or across network.

Operational Aspects

Install Considerations

- Installation of Veritas NetBackup and Media Manager

  Requires that the NetBackup server software be installed prior to installing NetBackup Vault Extension.
- Setup of specific NetBackup and Media Manager objects

  Certain objects (volume pools, classes, etc.) must be defined prior.
- Installation of Veritas NetBackup Vault Extension

  Consists of a core program and several supporting scripts. These will be installed on the NetBackup Master server.
- Configuration of vaulting parameter files
- Customization of vaulting scripts

  Some scripts require minor modifications to enable the vaulting program to access certain facilities (rsh access to ACSLS robotic controls, etc.)
- Setup of scheduled jobs

  Jobs are usually scheduled through the operating system scheduler (cron), along with any maintenance activities that wish to be performed.

Operational Considerations

- Can run multiple “vaults” simultaneously

  A “vault” would be known as a single robotically controlled device. Currently, multiple TLD robots require the definition of multiple vaults, since each is referred to as a separate robot within Media Manager. This is a known limitation in current release.
- Restarting of vaulting jobs after system failure

  After NetBackup and Media Manager processes, vaulting jobs should be manually restarted using the provided menu utilities
- Monitoring of NetBackup Vault Extension processes

  Currently, the vaulting processes are monitored via log files. These files may be monitored by an event management utility or from the command line. Log files are kept for each vaulting session and can be removed at the discretion of the administrator.
- Inventory commands should be executed after updating databases

  The scripts provided with NetBackup Vault Extension will update the vaulting files after a vault command updates the NetBackup or Media Manager databases. NetBackup Vault Extension maintains “snapshots” of both NetBackup and Media Manager databases so that previous vaulting reports can be generated after the session has completed.
- Monitoring of duplication pools

  It is imperative to maintain an adequate supply of duplication media so that vaulting processes can complete successfully.

Bpvault Batch Job

NetBackup Vault Extension runs **bpvault** as a batch process through several separate steps. The following is an example of a typical process used by NetBackup Vault Extension in a single batch:

- Reading of parameter file.
- Based on class and / or schedule definition, NetBackup catalog is browsed for appropriate images to duplicate or vault.
- Duplication of backup images or filtering of original images.
- Inventory tapes used during the duplication.
- Assign vault slot identifiers.
- Print reports for tapes to be ejected.
- Reports sent by email.
- Ejection of tapes.
- Inventory of robotic storage units, looking for tapes returned from offsite vault.
- Updating of Media Manager if new tapes found.
- Processing of robotic specific commands.

Documentation

For further information regarding NetBackup Vault Extension, there are other documents written for specific audiences:

- Functional Design – provides a general overview of vault management and details high level integration between NetBackup Vault Extension and NetBackup & Media Manager.
- System Administration Guide – provides an in-depth look at NetBackup Vault Extension including:
  1. Installation and Configuration
  2. Vaulting, Monitoring and Media Management Procedures
  3. Step-by-step Recovery Procedures
  4. Troubleshooting
  5. File and Directory Structure
  6. Parameter File Definitions
  7. Sample Parameter Files and Log Files
- Operations Guide – provides general procedures to be used in an operations environment including:
  1. Receiving Daily Notification of Process Completion
  2. Removing Appropriate Media from Robotic Storage Units
  3. Comparison of Physical Media with Generated Reports
  4. Transferring Media Between Data Center and Offsite Vendor
  5. Re-generation of Reports
  6. Replacing Media into Robotic Storage Units

Customer Support

NetBackup Vault Extension is supported through the standard Veritas Customer Support. Support is currently limited to 5x12 schedule. Simply call the Veritas Customer Support Center and submit a request for NetBackup Vault Extension support. The Support Center staff will gather any required information and a Veritas Customer Support Engineer will return the call.

Conclusion

NetBackup Vault Extension is a sensible solution to the problem of vault management for distributed systems. The system was designed to be closely integrated with NetBackup and Media Manager and to provide automated duplications, tracking of offsite media and report generation. Veritas intends to enhance NetBackup Vault Extension to help simplify disaster recovery operations.